



# **Mastercam**<sup>®</sup>

## PRODUCT GUIDE



MILL



MULTIAXIS



LATHE



MILL-TURN



WIRE



ROUTER



DESIGN



ADDITIVE

# STRENGTH AND STABILITY IN MANUFACTURING

Mastercam is backed by a strong and stable company, supported by the world's largest CAM network. At a time when consolidation in the CAM industry has caused problems for many manufacturers — with questions about what to do with lagging software and where to find support — Mastercam users work with confidence.

With an uncompromising focus on the success of manufacturers using our robust CAD/CAM software solutions, Mastercam is developed using four strategic touch points for strength and stability in manufacturing.

## PERFORMANCE

**Powerful tools for speedy performance.**

Mastercam is easy and intuitive to use but maintains a depth of features to support the most complicated jobs. Our toolpaths are elegant and remarkably efficient.

## PRODUCTIVITY

**Advanced solutions for manufacturing.**

We help connect the largest CAM community worldwide, and our success is a direct result of listening and responding to industry needs for productivity solutions from job setup to job completion.

## PARTNERSHIP

**Focus and cooperation for innovation.**

Our dedication to the manufacturing community drives Mastercam innovation. We collaborate with leading tooling, software, and machine tool manufacturers to develop new technologies.

## PROGRESS

**Managing resources for better results.**

Opportunities to drive down costs and increase profits can be found across the entire shop. Mastercam supports improved use of data-driven manufacturing in the digital age.

## FLEXIBLE LICENSING OPTIONS MAKE IT EASY TO BRING THE WORLD'S LEADING CAD/CAM SOFTWARE INTO YOUR SHOP.



### SUBSCRIPTION LICENSE

The most flexible way of purchasing Mastercam. This provides predictable payments, product license change capability, and more.

Included are all the benefits of a Software Maintenance Subscription at a lower up-front cost. This allows participants to access additional on-demand, live, and in-product services to achieve optimized usage of Mastercam solutions.



### PERPETUAL LICENSE WITH SOFTWARE MAINTENANCE SUBSCRIPTION

This is a perpetual software license to operate Mastercam. Paired with a Software Maintenance Subscription, this gives you the ability to use the latest version of Mastercam for the duration of the term.

Included are limited benefits of subscription license services to achieve optimized usage of Mastercam solutions.

# TABLE OF CONTENTS

02

## MASTERCAM'S INNOVATIONS FROM START TO FINISHING

Dynamic Motion® and Accelerated Finishing®.

04

## MILL

3D Dynamic OptiRough, stock-aware roughing, refined 3D toolpaths, and more.

08

## MULTIAXIS

5-axis roughing and finishing, plunge roughing, and flowline machining.

12

## LATHE

Quick toolpaths, custom thread forms, and more.

14

## MILL-TURN

Automated part transfers, tool planes, stock definition, and setup.

16

## WIRE

Efficient tab creation and management, straight or tapered cut from either direction, and more.

18

## ROUTER

Powerful 2D tools for nesting, contouring, pocketing, and drilling.

20

## DESIGN

Model Based Definition, focused mesh, surface, and solid model creation.

22

## EDUCATIONAL SUITE

Empower students with the CAD/CAM skills they need.

24

## INDUSTRY SHOWCASE

Mastercam tackles challenging productivity demands in a variety of manufacturing industries.

25

## ADD-ONS

Additional CAD or CAM tool makes a specific job easier, faster, and more profitable.

26

## TOOLS TO KEEP YOURSELF COMPETITIVE

Mastercam University®, Certification, and training.



# MASTERCAM'S INNOVATIONS FROM START TO FINISHING

## DYNAMIC MOTION TECHNOLOGY IS A GAME CHANGER



Dynamic Motion® toolpaths safely maximize material removal rate, reducing cycle times by 25 to 75%. Dynamic Motion uses a proprietary software engine to continually adjust toolpath motion to maintain a constant chip thickness everywhere on the part. The result? Consistent machining performance, shorter cycle times, and longer tool life.

For more details and to see Dynamic Motion in action, visit [Mastercam.com/dynamic](https://Mastercam.com/dynamic).

## ACCELERATED FINISHING TECHNOLOGY IS REWRITING THE RULE BOOK

Mastercam's Accelerated Finishing® technology is the next leap forward in using today's innovative profile tools and delivering greater efficiency and higher machining productivity. Collaborating with the industry's best tool manufacturers, we take full advantage of these new tool designs to dramatically reduce finishing cycle times while improving surface finish.



For more details and to see Accelerated Finishing in action, visit [mastercam.com/accelerated-finishing](https://mastercam.com/accelerated-finishing).

SAVE TIME AND MONEY			
100 titanium parts cut with and without Dynamic Motion toolpaths.			
<b>WITHOUT DYNAMIC</b>			
	X	\$100/hour machine cost = \$97.31	
		\$97.31 per part x 100 parts = <b>\$9,731</b>	
<b>WITH DYNAMIC</b>			
	X	\$100/hour machine cost = \$53.25	
		\$53.25 per part x 100 parts = <b>\$5,325</b>	
<b>47% reduction in cost</b>			



### REDUCE CYCLE TIME

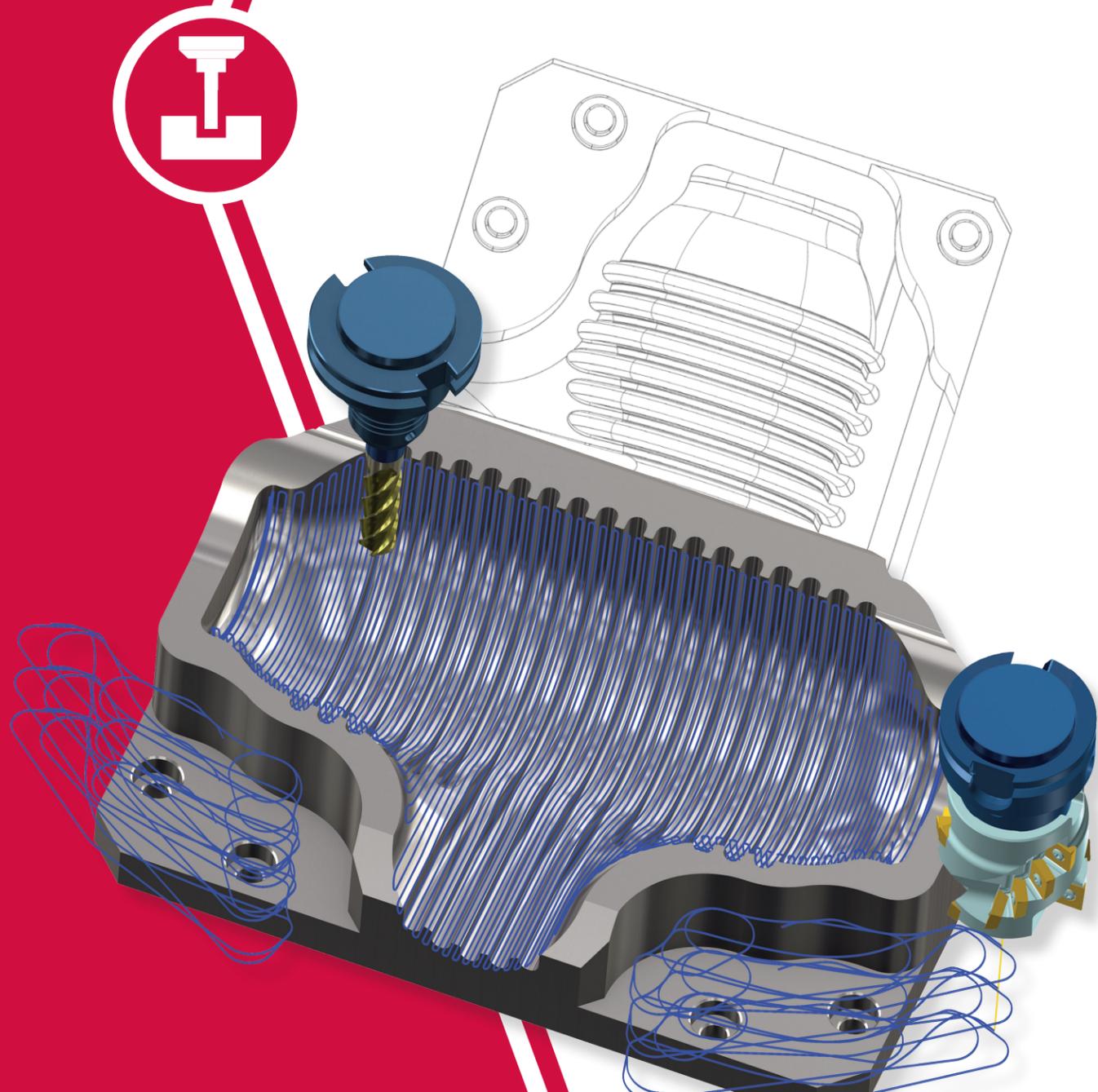
"We introduced Accelerated Finishing and a lens-shaped circle segment tool to an aerospace parts sub-contractor who machines aluminum structural parts. Cycle time decreased from 30 minutes to 3.5 minutes per part for an **88% improvement** and a cost savings of \$66 per part. On a 1,000 part production run, it meant **a savings of over \$66,000.**"

Dan Doiron, Product Manager-Milling, Emuge



# MILL

Mastercam Mill delivers CAD/CAM power and control with an intuitive programming interface.



## PRECISION AND EFFICIENCY FROM DESIGN THROUGH THE PRODUCTION LINE



### Outperform your expectations.

Mastercam gives you the power to drive your CNC equipment with precision and efficiency. Our toolpaths help your machines achieve a reliable, efficient, smooth, and accurate motion. Part quality, extended tool life, and repeatability — even the longevity of your machines — are directly related to this motion.

*Mastercam's active Stock Model, Toolpath Verification, and Simulation mean increased confidence on every project. Tool library support, including CoroPlus® and MachiningCloud, helps you make tooling decisions fast.*

### Flexible, expandable, and connected.

Comprehensive toolpath strategies provide multiple approaches for programming any part, regardless of complexity. Modify any element, and toolpaths are updated, eliminating rework.

Build libraries of your favorite machining strategies. Choose customized operations, apply them to your next job, and reduce your programming time. With interfaces to digital tool libraries and other manufacturing software, Mastercam ensures you are ready for the next digital revolution. Fast, easy, productive — the way programming should be.

*Mastercam Mill has been shop-tested more than any CAM program in the world. You can count on Mastercam for real-world, proven results.*

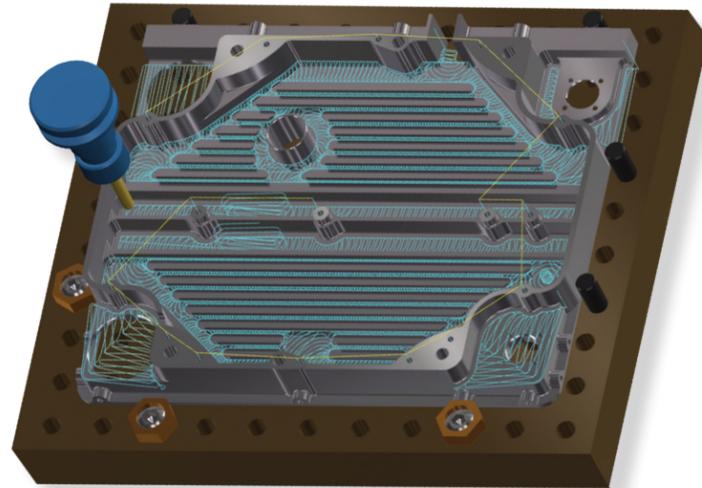


## 2D MILLING

From simple to complex, Mastercam Mill's 2D machining capability delivers the tools you need to compete.

- 3D power for your 2D parts — fast, automated 3D Dynamic OptiRough is included in all Mill products (Entry excluded).
- Feature Based Machining (FBM) automatically programs prismatic solid features like drill holes, contours, and pockets.
- Easy, safe, highly-automated hole making.
- Precision chip control for a wide set of tools, plus specialized tool support including ISCAR®'s High Efficiency Machining (HEM) tool set and more.

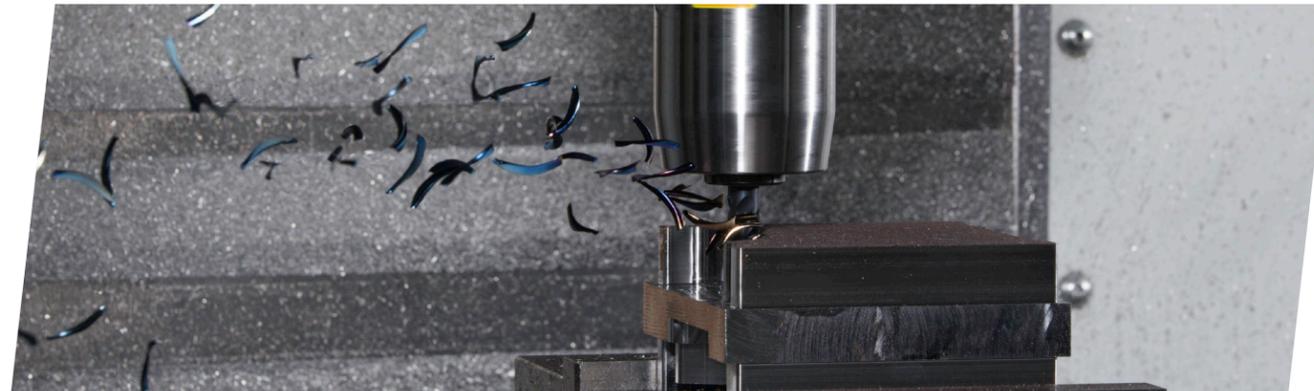
Dynamic Motion powers much of our 2D solutions. It allows you to maximize your material removal rate to minimize cycle time.



*Mastercam's 2D toolpaths deliver easy and optimized pocketing, contouring, drilling, facing, and much more.*

## TRIM YOUR PRINT-TO-PART TIMELINE

For 2D users — those that do a lot of pocketing and contouring — Dynamic OptiRough is a game changer for programming prismatic parts. Previously only available to 3D users, this toolpath lets you rough an entire prismatic solid part fast, in one operation instead of individual roughing, pocketing, and contouring toolpaths. It's an incredible time saver.



## 3D MILLING

Mastercam provides unsurpassed control on surface cuts, delivering superior finishes and optimized cycle times.

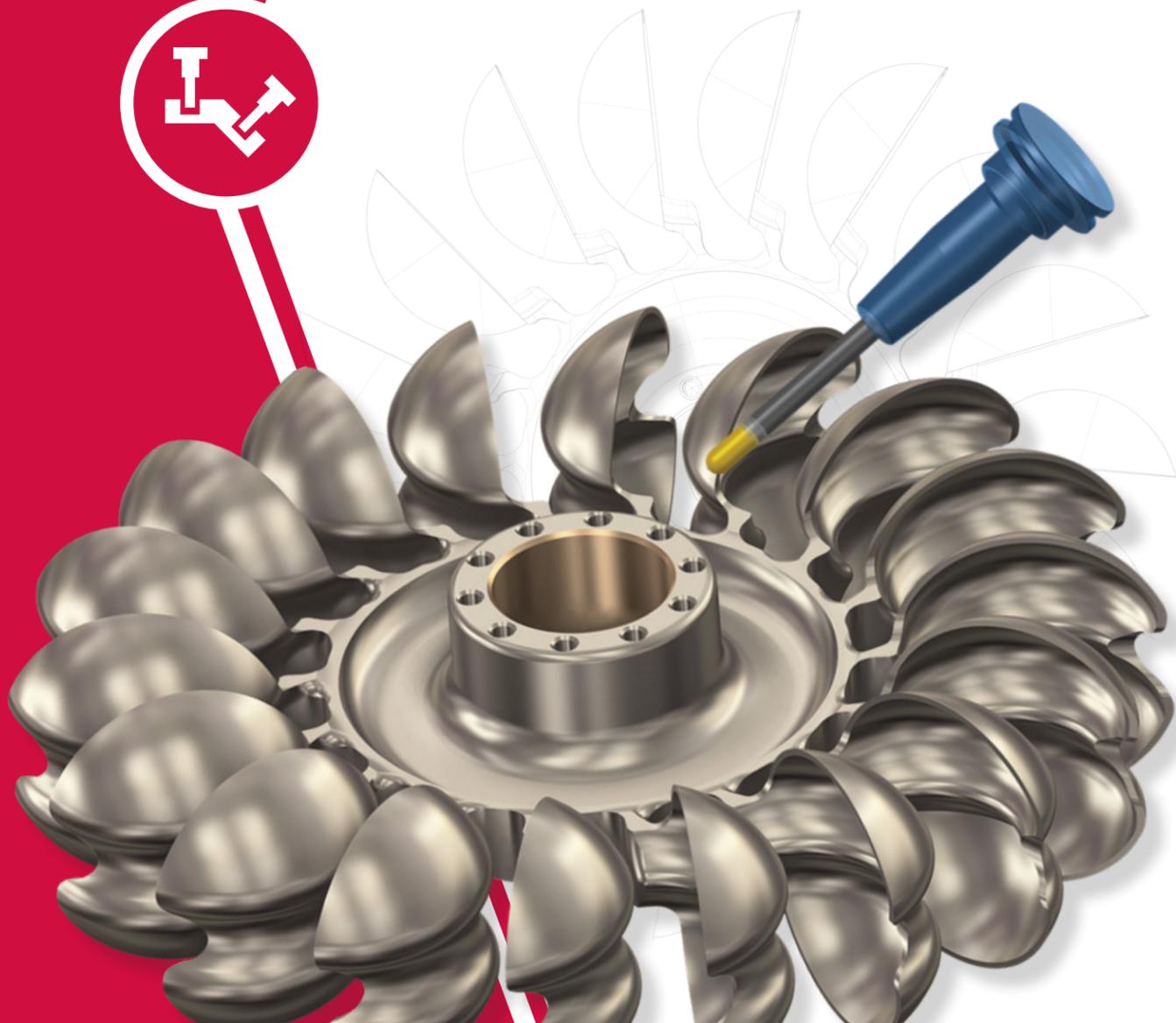
- Stock-aware roughing, remachining, semi-finishing, and finishing ensure precision parts.
- Mastercam's Dynamic Motion technology powers dramatically efficient roughing.
- Constant scallop machining maintains a consistent finish on sloped and flat surfaces.
- Constant-Z rest milling (remachining) identifies and machines areas needing a smaller tool.
- Smart control over motion between cuts for smooth, efficient results.
- Hybrid finishing creates a single toolpath that changes cut methods as the slope changes.

Cut multiple surfaces, solid models, and mesh data — our refined 3D toolpaths give you a smooth, precision finish to please even your toughest customers.

**To learn more about Mastercam's Mill solutions, visit [mastercam.com/mill-solutions](https://mastercam.com/mill-solutions).**

# MULTIAXIS

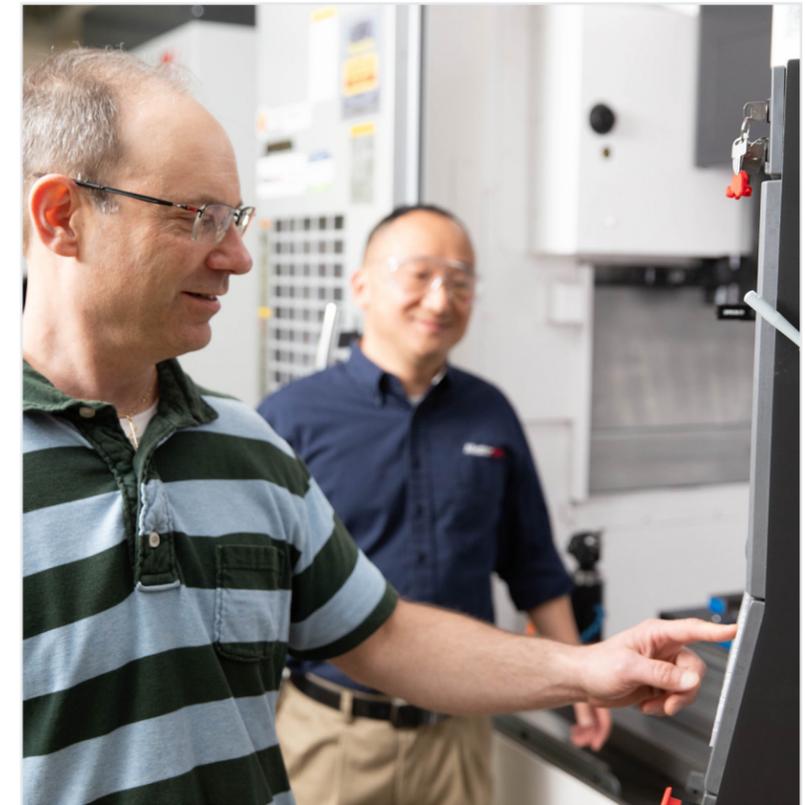
Enhance your productivity with Mastercam Multiaxis for intuitive programming of complex parts.



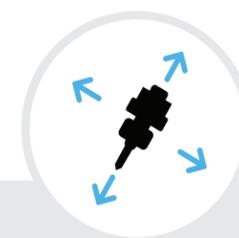
## SIMPLIFIED ACCESS TO COMPLEX MACHINING

**A practical solution to enhance productivity.**

Mastercam's Multiaxis is a powerful 4- and 5-axis solution that can work in conjunction with Mastercam Mill 3D, Mastercam Router 3D, and Mastercam Mill-Turn. This product maintains stock model awareness, a 5-axis safe zone around the machined part, and tilt axis limits on the tool angle to avoid violating machine limits for the safest machining possible. It also comes with extensive dynamic-style roughing capabilities for going beyond 3+2 roughing and into full simultaneous motion material removal. The abilities of Multiaxis, which range from standard to advanced, give users complete control over cut pattern, tool axis, and collision avoidance.



**Cut Patterns**, ranging from simple 2D wireframes to complex multisurface grids, guide the cutting along predetermined paths. These varied toolpaths optimize cutting while ensuring safety.



**Tool Axis Control** gives users the ability to specify tool axis, lead/lag, entry/exit, and tilt. This technology orients the tool's center axis as it follows the cut pattern, and it uses advanced gouge checking and a 5-axis safe zone during machining to protect the part.

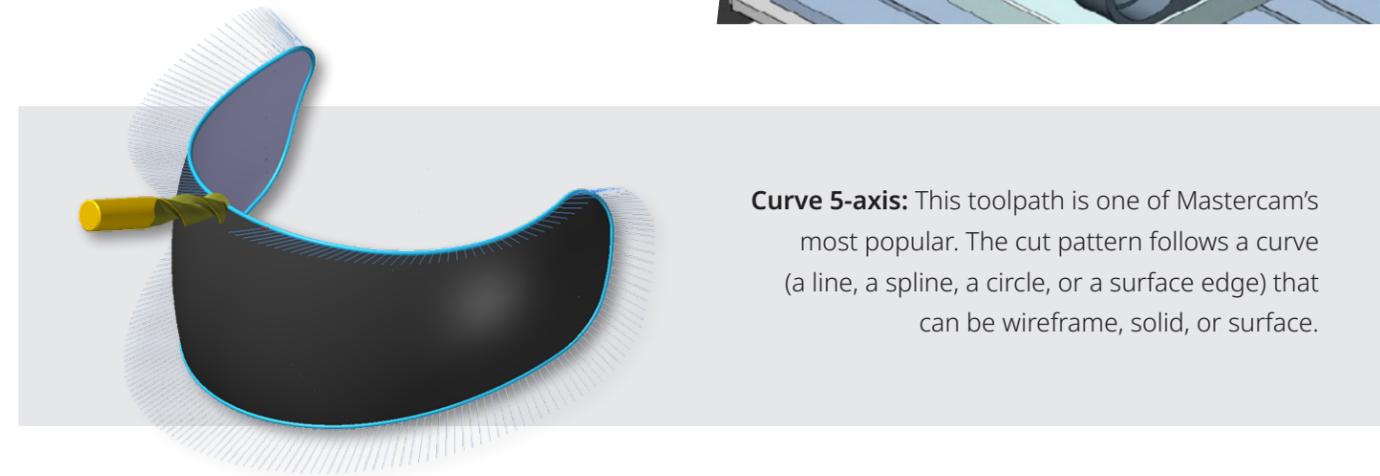
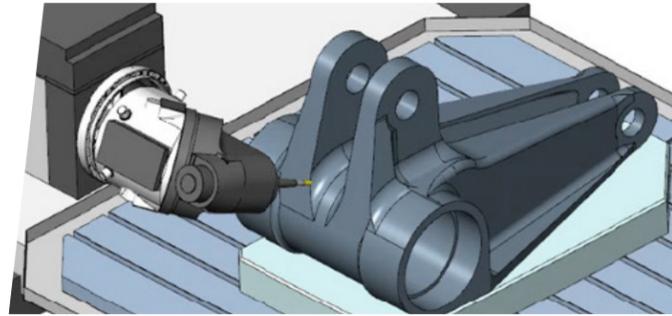


**Collision Control** provides a "near miss tolerance" field so that users can choose exactly how close they want to allow the tool to approach any workholding or machining component.

## Popular Multiaxis Toolpaths

**Unified 5-axis:** The result of customer feedback, with the Unified toolpath, users need to only select their Machining and Avoidance geometries once before being able to experiment with Cut Patterns. Not needing to reselect geometries every time will save mouse miles and time.

**Deburr 5-axis:** Sharp edges are common occurrences on completed parts. Deburring those edges is a challenging manual task, and keeping up consistency is nearly impossible, but Deburr 5-axis automates this process.



**Curve 5-axis:** This toolpath is one of Mastercam's most popular. The cut pattern follows a curve (a line, a spline, a circle, or a surface edge) that can be wireframe, solid, or surface.

**Swarf 5-axis:** Sometimes called "Flank-milling", Swarf 5-axis uses the side of a tool to cut a wall. It is very popular in aerospace milling.



**Tilt to Avoid:** Available in Mastercam's 3D HST Finishing paths, Tilt to Avoid is the fastest way to add Multiaxis motion to a 3-axis toolpath. With just one click, the tool assembly is checked against the machining and avoidance geometries and introduces tilt where necessary to machine the path.



## Make It Multiaxis

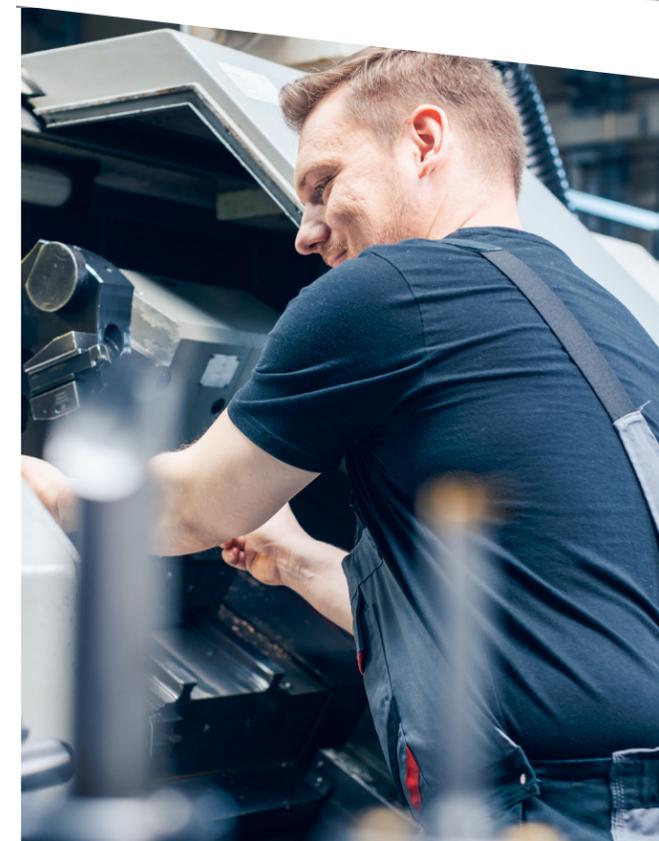
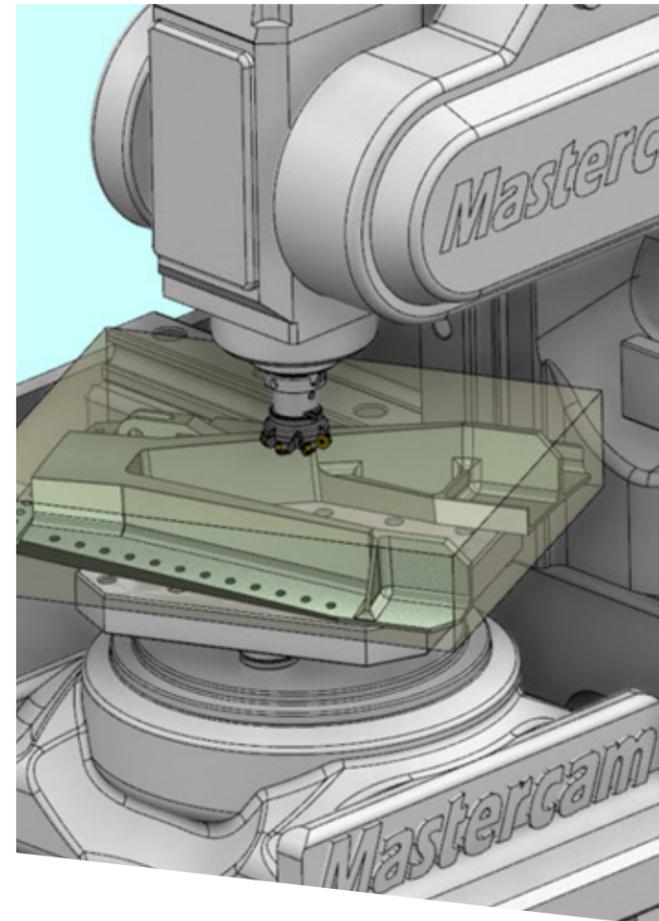
Multiaxis machining expands on the traditional 3-axis machine's motion abilities. Instead of moving along three simple linear axes, Multiaxis machines can move in four or more directions by adding rotary axes and parallel linear axes. Some modern Multiaxis centers can use nine axes, but most use only four or five simultaneously.

Launching into the Multiaxis world can be — understandably — daunting. In the past, access to training resources could be limited, and often, the only publicly available material came from forums or user YouTube videos. While these are still valuable resources, Mastercam has taken steps in recent years to make learning easier. Mastercam University is an online learning center full of self-directed courses that walk users through simple and advanced machining topics. It has a full, end-to-end Multiaxis course on all our toolpaths and on standard Multiaxis machining concepts as well.

*Make it quicker. Make it easier. Make it yours. **Make it Multiaxis.***

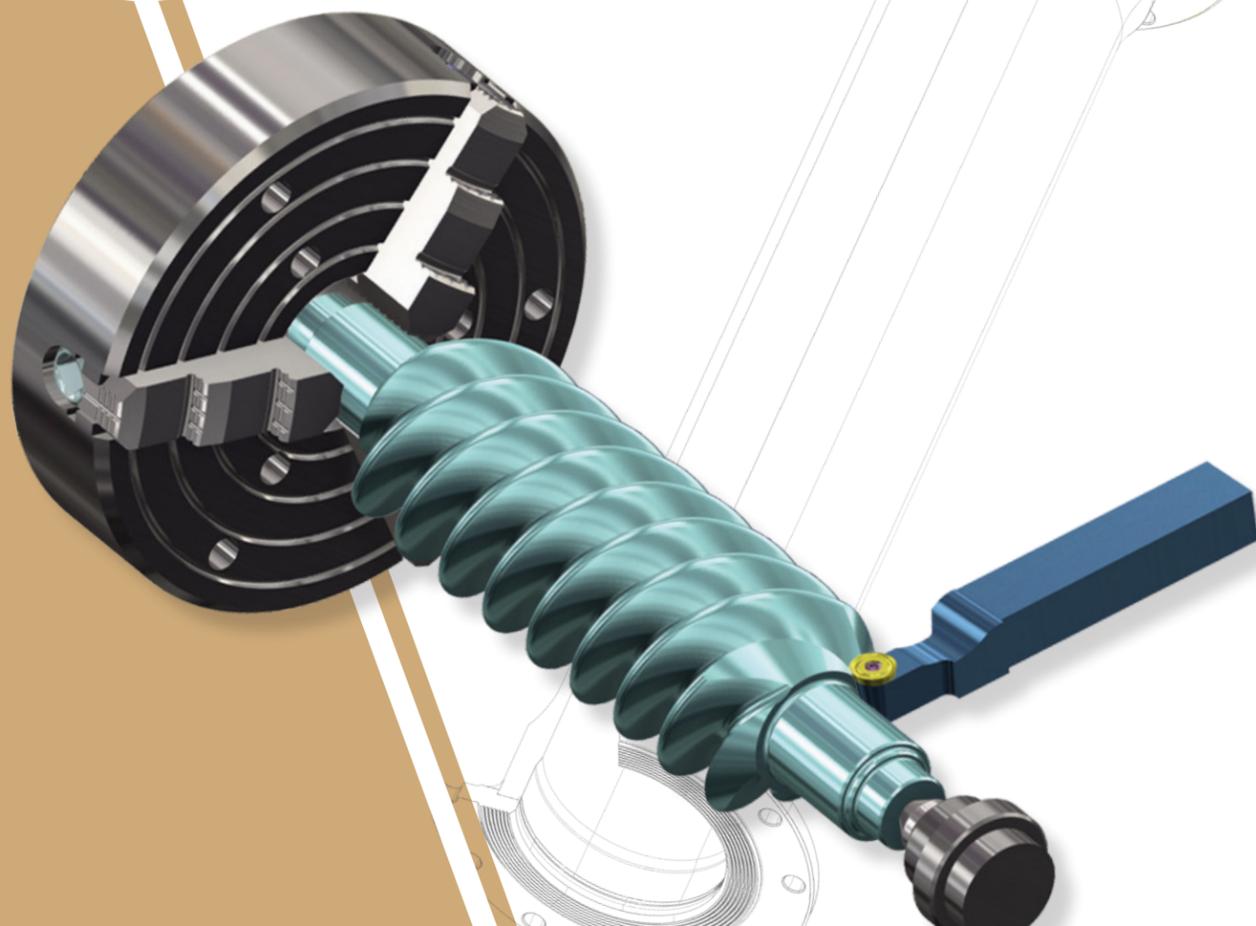
Mastercam and its Channel Partners have also produced and released extensive official YouTube tutorials on everything from individual toolpath use to fully-fledged examples with real parts. Many Channel Partners also offer training at their locations or will even visit your shop, and all of them will have their own Multiaxis resources and experts to help you make the most of your software. If you want in-person training, reach out to your local Channel Partner as a first step.

To learn more about Mastercam's Multiaxis solutions, visit [mastercam.com/multiaxis](https://mastercam.com/multiaxis).



# LATHE

Mastercam Lathe lets you move the same part file between milling and turning operations with ease and confidence.



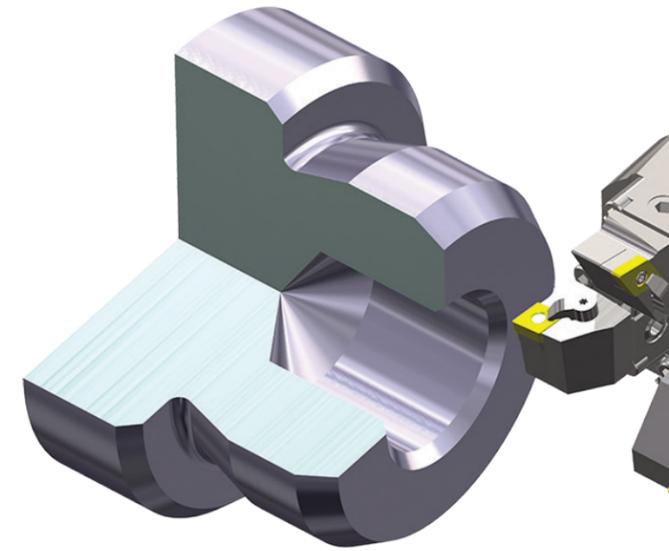
## POWERFUL, FLEXIBLE TOOLS FOR TURNING

### A set of tools that streamline your entire process.

From importing CAD files to Dynamic roughing and precision finishing, Mastercam Lathe gives you a variety of strategies to turn parts with greater efficiency and productivity.

### Efficient programming, designed for modern manufacturing.

Mastercam Lathe delivers a set of easy-to-use, advanced programming tools, with greatly expanded options when paired with Mastercam Mill. Easy rough, finish, thread, groove, bore, and drill routines combine with *CY*-axis machining to cut any job. Dependable toolpath verification ensures your parts are done right the first time.



### Fast, easy turning.

- Program in a few clicks with Quick Toolpaths.
- Complete threading including custom thread forms.
- Grooving with multiple depth cuts, peck motion, and full-radius plunge turning.
- Intelligent ID, OD, face roughing, and finishing.
- Full milling support available for machines with live tooling or C and Y axes.

### Safe machine and cut control.

- Chuck, part, steady rest, and tailstock detection.
- Automatic gouge checking on the tool's front and back.
- Control chip breakage on difficult-to-machine materials.
- Full collet and solid jaw support.
- Expanded job setup, part transfer, and programming options on select lathes.

## SWISS MACHINE SOLUTIONS

You no longer need a separate software package for Swiss machines — something programmers and machinists appreciate. Our Swiss machining solutions combine Mastercam Mill and Mastercam Lathe with specialized post processors. This configuration adds machine-specific controls inside the Mastercam interface, delivering accurate G-code for a wide variety of Swiss machines.

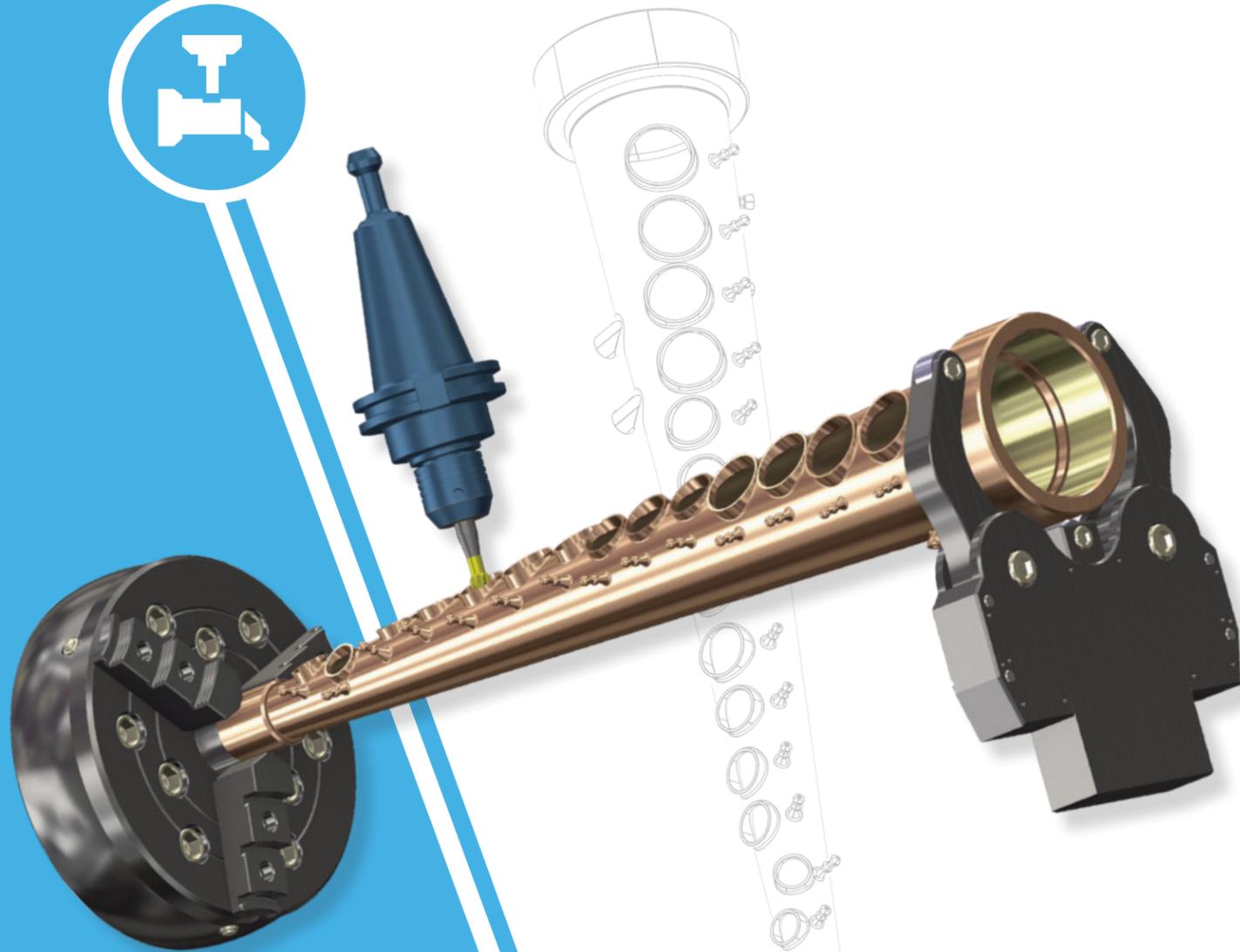
The solution provides customized choices directly within Mastercam for:

- Swiss-style bar feed stock advance.
- Machine-specific setup parameters.
- Swiss-style pick off / cut off strategies.
- Expandable custom machine options including lasers, high-frequency turning, high-pressure coolant, and more.

To learn more about Mastercam's Lathe solutions, visit [mastercam.com/lathe](https://mastercam.com/lathe).

# MILL-TURN

Automate your complex programs for high-powered, multitasking machining centers. Program it right the first time, every time.

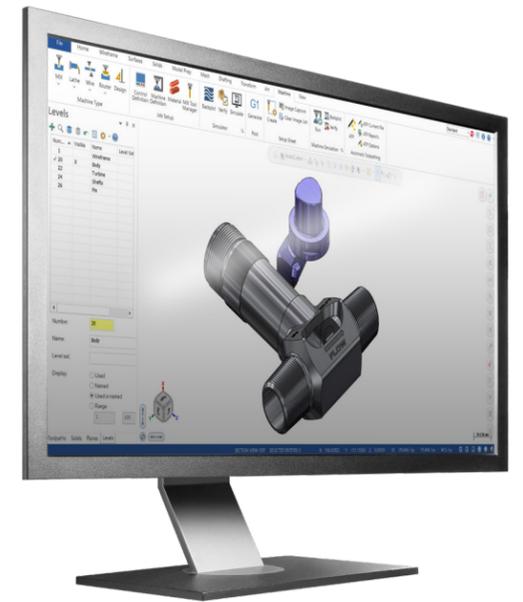


## STREAMLINED MACHINING CAPABILITIES

**Mastercam Mill-Turn simplifies control of high-powered, multistream machining centers.**

With Mastercam, your workflow is efficient. Choose your machine, and Mastercam Mill-Turn automates part transfers, tool planes, stock definition, and setup. Then apply your toolpaths, quickly synchronize them, verify your project with simulation, and post your code. Changes along the way are fast and easy — the way programming should be.

Mill-Turn's Sync Manager is a user-friendly way to optimize part cycle times and manage interactions between toolpath operations. Easily navigate a Gantt-style timeline and vertical stream interface to coordinate operations and track cycle times.



*Fast, flexible setup, synchronization, and simulation combine to help you get the most out of your mill-turn machines.*



**Get more out of your machines with Machine Simulation.**

Machine Simulation provides visual verification and assurance that the interaction and syncing between operations performs exactly as you planned. Validate against potential collisions and track cycle time estimates to achieve maximum efficiency.

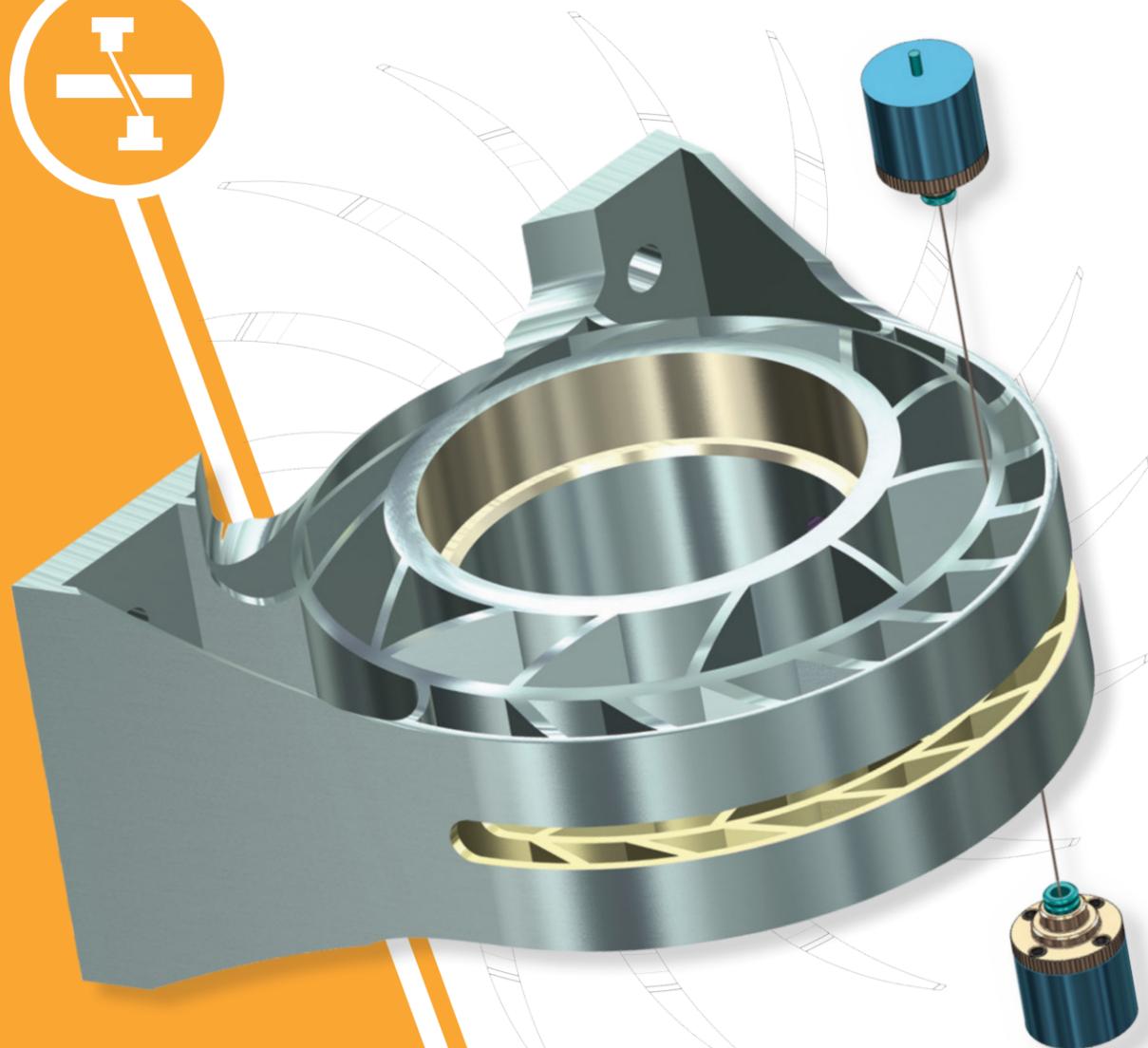
**Avoid mistakes. Save time and money.**

Machine components, custom workholding, multiple steady rests, tailstock, tools, and parts are simulated from the safety of your desktop, ensuring a safe and secure machining experience. You can identify potential collisions, see your cutting motion, and explore ways to optimize your processes with simulation. View all streams and statistics of the entire machining process, with the capability to jump to any point in the process with the click of a button.

To learn more about Mastercam's Mill-Turn solutions, visit [mastercam.com/millturn](https://mastercam.com/millturn).

# WIRE

Mastercam Wire delivers powerful, comprehensive wirepaths in a streamlined, easy-to-use interface.



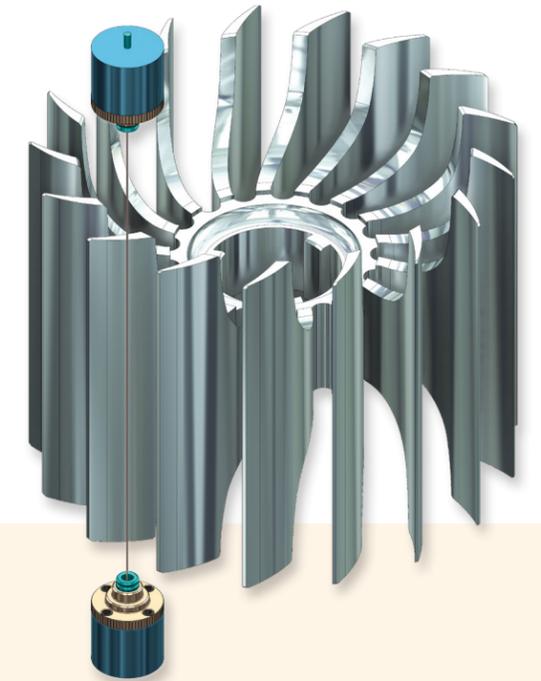
## MASTERCAM CONTROL FOR WIRE EDM

### Designed for efficiency.

Mastercam Wire lets you move a single part file between machines, saving time and avoiding mistakes. User-customizable wire libraries store power settings and other registers for rough and skim passes.

Other features include:

- Efficient tab creation and management.
- Control settings for corner types and taper angles at any point in the contour.
- Straight or tapered cut from either direction.



### Choosing the best software for your success includes many factors to consider

A global community of Mastercam users, experts, educators, and enthusiasts helps you get the most from your investment. Mastercam Channel Partners bring years of experience, helping to ensure that you are getting the most practical and comprehensive support in the industry.



### Expand your shop's capabilities.

For basic 2-axis contouring and complex 4-axis motion, you can be ready for any job. Mastercam delivers:

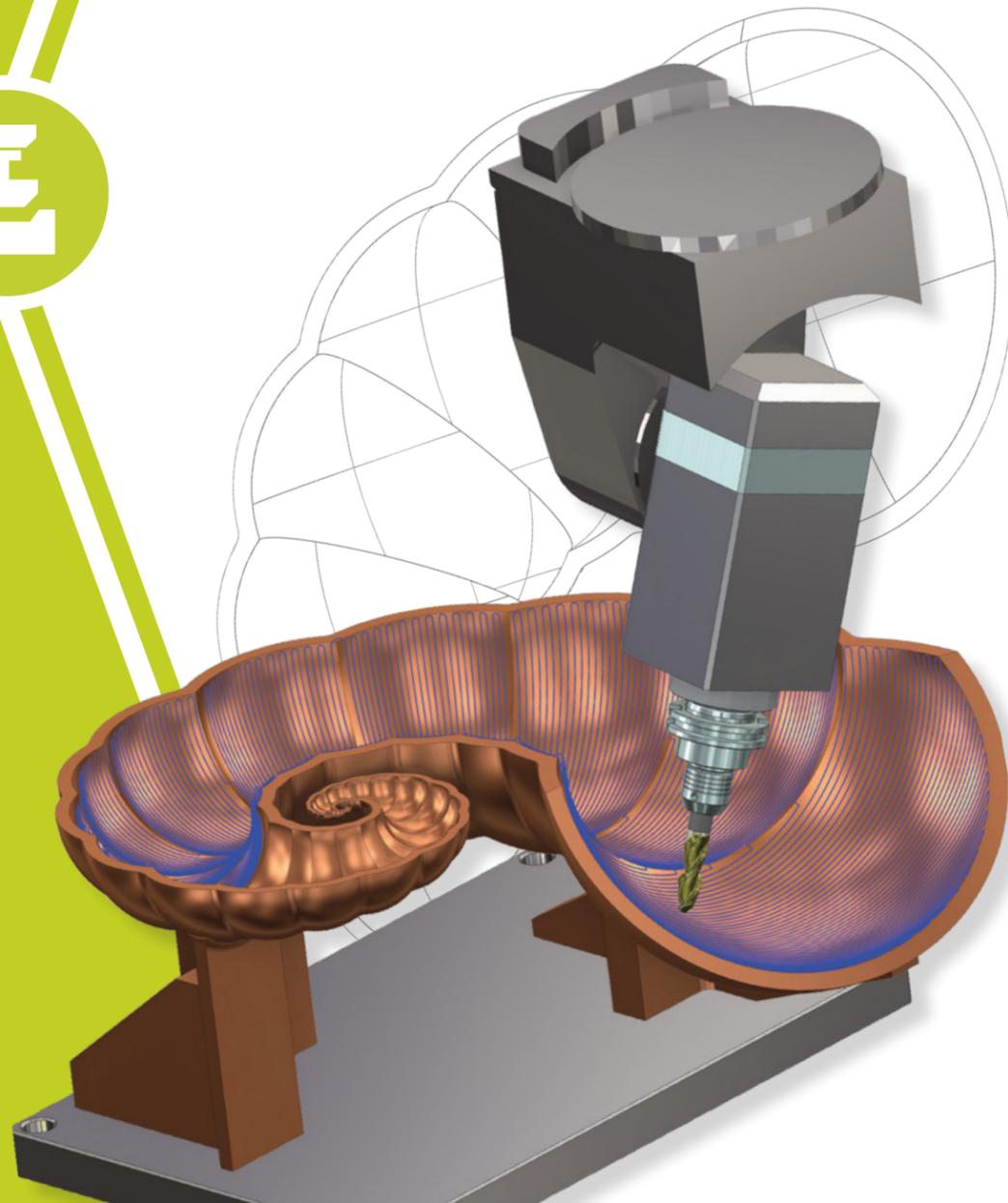
- **Contouring** made easy in 2- or 4-axis.
- **Automatic** lead-in and lead-out strategies.
- **Automatic or manual** 4-axis syncing.
- **Automatic** skim and reverse cuts.

Open virtually any CAD file or use Mastercam's built-in 3D modeling tools.

To learn more about Mastercam's Wire solutions, visit [mastercam.com/wire](https://mastercam.com/wire).

# ROUTER

Mastercam Router delivers complex routing functionality from an easy-to-use interface.

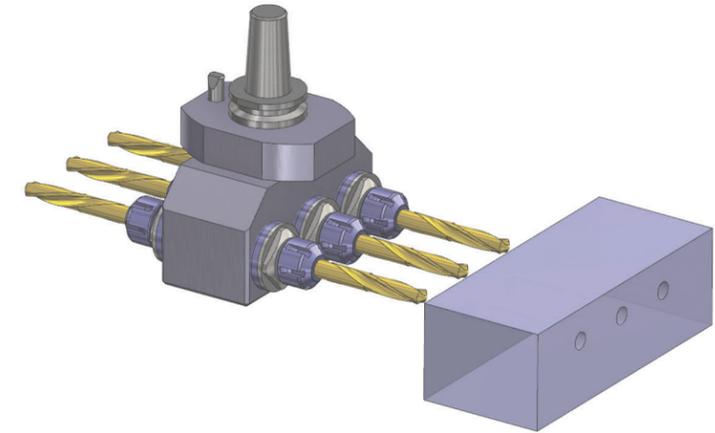


## FLEXIBILITY AND CONTROL

Mastercam Router offers solutions for all your 2D, 3D, or multiaxis challenges — from wood to composites.

Once you program a part, no matter how complex, you can modify any element of the job and get updated toolpaths without slowing down. You can also build a library of your favorite machining strategies and apply them to new models.

Mastercam's powerful Dynamic Motion technology not only helps extend tool life and reduce machine wear, but helps eliminate tool dwell damage as well. **Automatic Toolpathing (ATP)** brings in parts from today's top design packages to help speed flat panel work.



*Mastercam Router streamlines multiple tool programming including block drills and aggregate heads.*



### A comprehensive package of powerful tools.

2D machining can range from simple to very complex. Mastercam Router delivers powerful 2D tools from nesting, contouring, pocketing, and drilling to automated, feature-based, solid model programming.

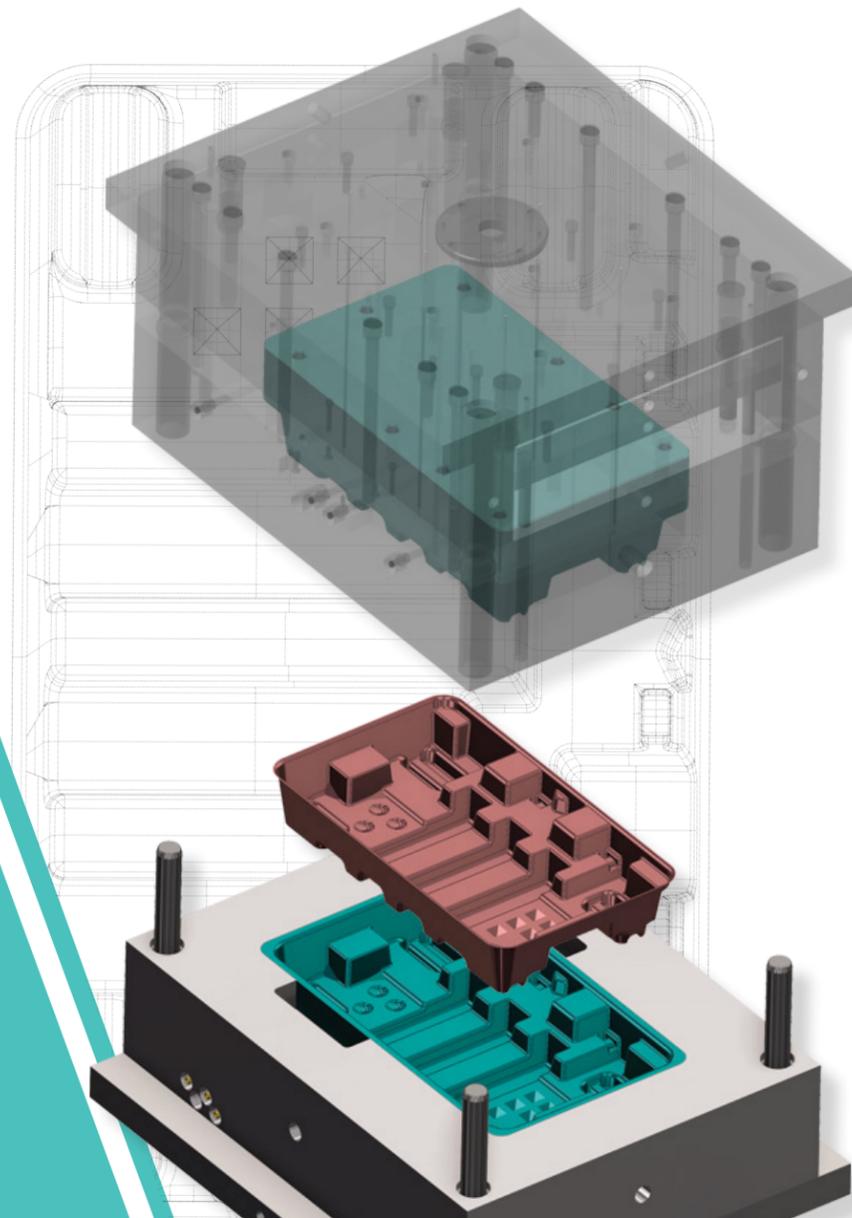
For 3D machining, Mastercam Router gives you streamlined, efficient 3D roughing and finishing, including automated leftover stock cleanup.

Mastercam's multiaxis capabilities give you complete control over the three crucial elements of multiaxis machining: cut pattern, tool axis control, and collision avoidance.

To learn more about Mastercam's Router solutions, visit [mastercam.com/router](https://www.mastercam.com/router).

# DESIGN

Focused CAD means machine-ready parts faster.



## MODELING AND PREP TOOLS

Get your parts on and off the machine quickly.

Whether you bring in a file from an outside CAD package or design one yourself, Mastercam's powerful, easy-to-use CAD engine is included in each main Mastercam product and is also available separately.



Quickly and easily separate and program solid assemblies.

### Work with your existing CAD files.

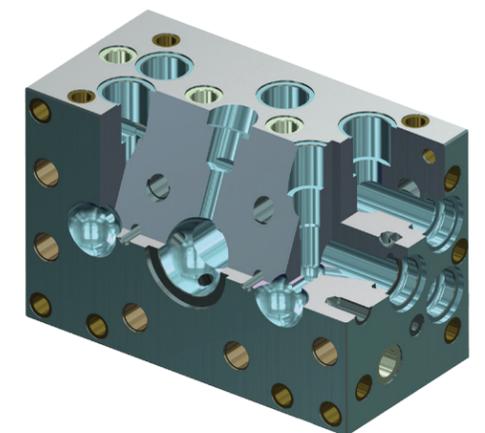
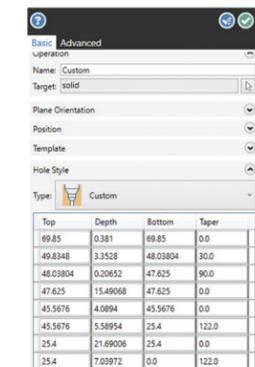
Mastercam helps to preserve design intent with Model Based Definition (MBD) support and acceptance of varied file formats. These include IGES, Parasolid®, SAT (ACIS solids), AutoCAD® (DXF, DWG, and Inventor™ files), SOLIDWORKS® (including history tree), Solid Edge®, SpaceClaim, STEP, STL, and more. Add-On translators are available for Siemens NX, CATIA™, Pro/E (PTC Creo), and more.

### Whether you are prepping customer files...

Getting a part file from an outside source can pose unique challenges. You might need to repair a surface, cap or hide a feature, or create an electrode. You may need to streamline, fix, or modify a complex mesh, or just make sure your fixtures are represented on the part. Mastercam includes a powerful set of model prep tools to make sure the process goes smoothly. Focused mesh, surface, and solid model creation and editing tools let you bring a part from the designer's desk to your machining process, fast.

### ...or designing your parts from scratch.

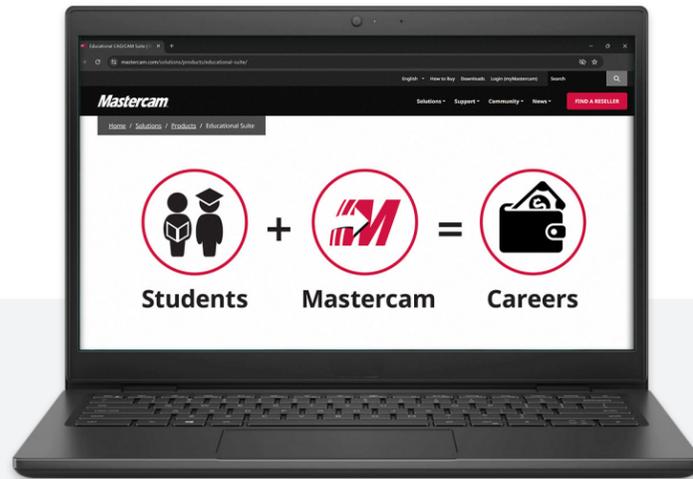
Having powerful CAD at your fingertips makes your CAM system that much more effective. Mastercam includes a robust set of modeling tools, from complete wireframe to surface and solid modeling. A true hybrid modeling system, Mastercam lets you create, combine, and machine whichever CAD geometry suits your needs.



To learn more about Mastercam's Design solutions, visit [mastercam.com/design](https://mastercam.com/design).

# EDUCATIONAL SUITE

Mastercam empowers students with the CAD/CAM skills they need for successful careers in manufacturing.



## FROM THE CLASSROOM TO THE PRODUCTION FLOOR

### Shape the future. Teach with Mastercam.

The Mastercam Educational Suite gives teachers the power to put the world's #1 CAM software at students' fingertips, because your students deserve the best.

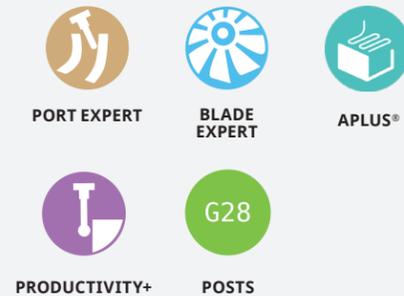
Our Educational Suite\* comes complete with the following:



### Every classroom and program is different.

Mastercam gives you the power to customize solutions to the unique requirements of your curriculum.

Mastercam Add-Ons available for specialty manufacturing include:



# PREPARE YOUR STUDENTS TO SHAPE THE FUTURE OF MANUFACTURING

- **One-stop solution** offering CAD, milling, turning, wire EDM, and more.
- **Easy to teach** and easy to learn with a simplified user interface option — great for new users.
- Trusted platform with **30+ years** of direct service to educators.
- **Technological leadership** gives students access to tools used in professional shops.
- **Free resources** for teachers and students include Mastercam Learning Edition & Mastercam University.
- **Open platform** lets you design in Mastercam or use CAD files from other sources.



### User Support

Mastercam Channel Partners form a much needed conduit between education and industry. Teachers and students gain direct access to our industrial channel's deep knowledge of CAD/CAM and manufacturing options. And when students are ready for the job market, they benefit as members of the world's largest industrial CAM network.



### Mastercam Educators Alliance

The Mastercam Educators Alliance (MEA) is a growing community of educators who teach and use Mastercam. It provides a free platform to interact with other instructors and gain access to subject matter experts and content that is tailored to the needs of MEA members.

### Student Outreach

Mastercam is dedicated to giving students access to CAD/CAM software to help them prepare for a career in Manufacturing. We are strong supporters of a number of motivational competitions for students. We are a Global Industry Partner of WorldSkills International and Mastercam is the exclusive software used in the CNC Milling & CNC Turning competitions.



To learn more about our Academic Resources, visit [mastercam.com/academic-resources](https://mastercam.com/academic-resources).

\*Solutions in the Mastercam Educational Suite provide the same interface and capability to drive CNC equipment as industrial versions, but files are saved in a format that is not compatible with industrial versions of Mastercam.

# INDUSTRY SHOWCASE

Mastercam is the most robust CAM used around the world in a variety of manufacturing industries. From aerospace to automotive and education to energy, Mastercam tackles challenging productivity demands.



## Aerospace & Defense

Manufacturers obtain manufacturing technology for quality and precision at an exceptionally high level.



## Medical

Mastercam offers manufacturers quality and precision at the highest level needed for medical applications.



## Consumer Goods

Mastercam offers manufacturers great product design and manufacturing productivity, while cutting boosts and maintains quality.



## Tool & Die

Manufacturers utilize Mastercam software for shorter cycle times and precision finish for productivity and profit.



## Education

Educators choose Mastercam to introduce students to manufacturing and provide practical skills and experience.



## Transportation

Mastercam provides manufacturers with productivity enhancements across diverse applications.



## Energy

Mastercam offers manufacturers the precision, flexibility, and fresh innovation they require.



## Woodworking

Manufacturers use Mastercam solutions for dynamic production needs using CNC machines.



## Heavy Industry

Manufacturers utilize Mastercam software to maximize production capacity without sacrificing quality.

To learn more about industries we support, visit [mastercam.com/solutions/industry](https://www.mastercam.com/solutions/industry).



## MASTERCAM'S SPECIALIZED ADD-ONS

Often, that one additional CAD or CAM tool makes a specific job easier, faster, and more profitable. If you need very specialized options to precisely match your customer, your workflow, or your products, Mastercam Add-Ons can help.



### Port Expert

Create precision engine cylinder head porting toolpaths on surface or solid data, while minimizing unnecessary motion.



### Mastercam Productivity+™

Brings Renishaw® in-process probing and inspection to your Mastercam programs. Easily set up, validate, and even make in-process adjustments where appropriate.



### Blade Expert

Highly efficient toolpaths for multibladed parts, delivering superior blades, splitters, floors, and fillets.



### Deburr 3-Axis

Take advantage of the streamlined Deburr cycle in a 3-axis environment without a Multiaxis license. Streamlines any deburring process, saving time and improving deburr quality. Deburr 3-Axis enhances and simplifies the deburring process through automatic edge detection.



### ProDrill

Automatically detect, group, and apply drill strategies to large amounts of holes, and automatically create tool definitions from existing geometry.



### APlus®

Designed for additive manufacturing (AM) using Direct Energy Deposition (DED). APlus has toolpaths developed specifically to handle any geometry in AM, as well as features and utilities designed to remove uncertainty out of the process and to improve efficiency.

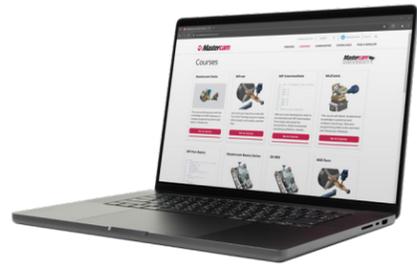


### 5-Axis Curve Machining and Drilling

A targeted and powerful multiaxis technique that adds extra flexibility to your milling; can be upgraded to the full Multiaxis product.

To learn more about Add-Ons, visit [mastercam.com/solutions/add-ons](https://www.mastercam.com/solutions/add-ons).

# TOOLS TO KEEP YOURSELF COMPETITIVE



## Mastercam University®

Online, video-based training developed by Mastercam and trusted partners. Sharpen your skills on your own schedule, use it to bolster your resume, and access the materials you need for Mastercam Certification. Mastercam University is easy to use, gives you real-world training applications, and covers all levels of Mastercam skills from basic to advanced.

[University.Mastercam.com](https://University.Mastercam.com)



## Mastercam Certification

If you are looking to set yourself apart as a skilled Mastercam programmer in the increasingly competitive job market, Mastercam Certification is the answer. Your path to Mastercam Certification begins at Mastercam University. With certified Mastercam credentials, you can advance your programming skills and earn the competitive advantage you seek.



## Mastercam Training and Support

CAD/CAM is a support-intensive business. We understand that our users require comprehensive training options to get started with Mastercam and then to stay current with the latest advancements.

To get the best training, you need flexible options, and the strength of the Mastercam community means our users have access to a global network of excellent opportunities for training.

### Corporate Training from Mastercam

- Mastercam University offers online training courses with video-based instruction in a variety of CAD/CAM disciplines and Mastercam products.
- Live, virtual training sessions offered throughout the year in multiple time zones.
- Mastercam knowledge bases and select tutorials are accessible with your **Mastercam.com** account.

### Channel Partner Training

- Your local Channel Partner is the best place to find out about training opportunities using the world's most widely used CAM software. Mastercam Channel Partners can help you access on site, classroom, and virtual trainings for everything from standard skills tutorials to customized CAD/CAM workshops for the specific needs of your manufacturing enterprise.

### Third-Party Training

- Mastercam users enjoy access to a variety of training options available from official, third-party training partners.

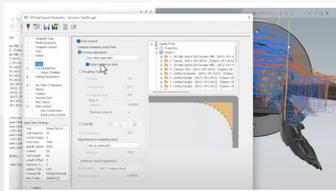


# Replicating History with Power and Precision

The Winged Victory or Nike of Samothrace is a statue prominently featured in The Louvre Museum in Paris, France. Mastercam recently teamed up with YASDA Precision, Mitsubishi Materials, and Methods Machine Tools to create an 11-inch replication of the famed 18-foot statue.

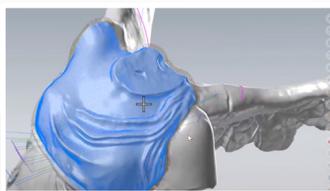
Within Mastercam, the statue is a mesh file with over five million facets and was 10 gigabytes in size. Mastercam took the part from a raw piece of stock all the way to a finished part. The overall cycle time on this project was over 110 hours – just under five straight days!

This piece exhibits the flexibility, customization, and functionality Mastercam offers as the **Most Robust CAM Solution**. Here are several highlights of Mastercam features used to create this amazing piece:



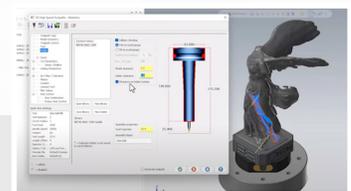
## Detect Undercut Stock

By using this feature, the run time of the toolpath was cut by a third from 18 minutes to 12 minutes. The Detect Undercut Stock checkbox was invaluable because this part was full of hidden undercuts.



## Unified Multiaxis

The Unified Multiaxis toolpath helped finish the Nike statue as it allowed the YASDA machine to make long sweeping motions in several phases of the project, including the wings and the front of the dress.



## Advanced Holder Checking

Mastercam has the ability to apply holder checking, which means we can trim our toolpath motion or create tilt motion anytime our tool holder will interfere with the part.